

(12) UK Patent Application (19) GB (11) 2 154 968 A

(43) Application published 18 Sep 1985

(21) Application No 8505667

(22) Date of filing 5 Mar 1985

(30) Priority data

(31) 586519

(32) 5 Mar 1984

(33) US

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(51) INT CL⁴

B60P 3/00 B60K 1/04 B64F 1/32

(52) Domestic classification

B7H 513 62X 741 A DX

(56) Documents cited

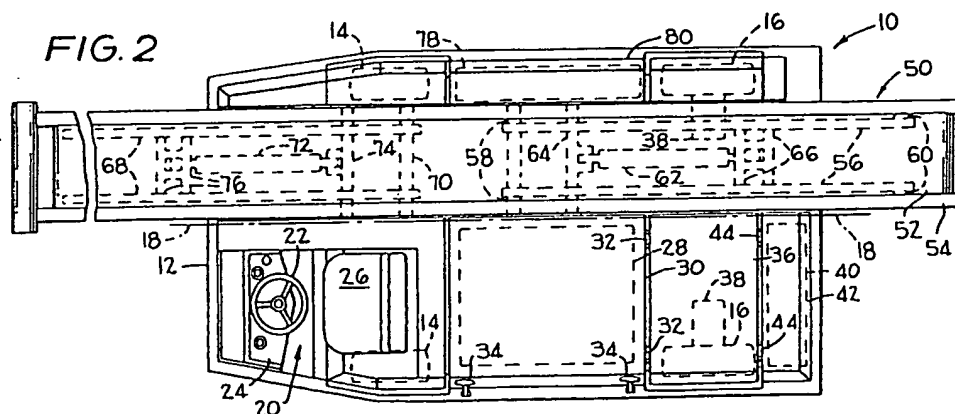
None

(58) Field of search

B7H
B7B

(54) Aircraft belt-loader vehicle

(57) A battery-powered aircraft belt-loader vehicle (10) with a low profile comprises a pair of steerable ground-engaging front wheels (14), a pair of ground-engaging rear drive wheels (16) driven by a pair of electric motors (38), a battery pack (28) connected to power the motors and supported on the vehicle frame (12) to one side of the frame center line (18), and a belt conveyor (50) mounted on the frame (12) on the other side of the center line (18). The belt conveyor can be raised and tilted by power cylinders (62,72). Personnel tending the belt conveyor can stand on horizontal surfaces of a battery cover (30), wheel cover (36), control compartment cover (42), and hydraulic equipment compartment (80). The covers (30,42) are hinged to facilitate servicing access.



GB 2 154 968 A

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FIG. 1

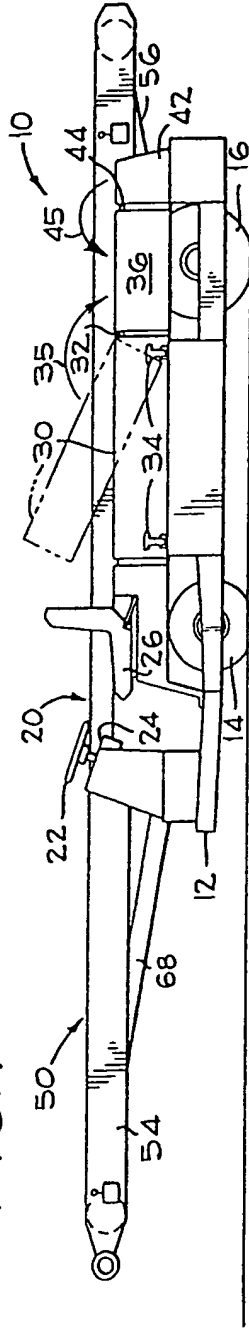
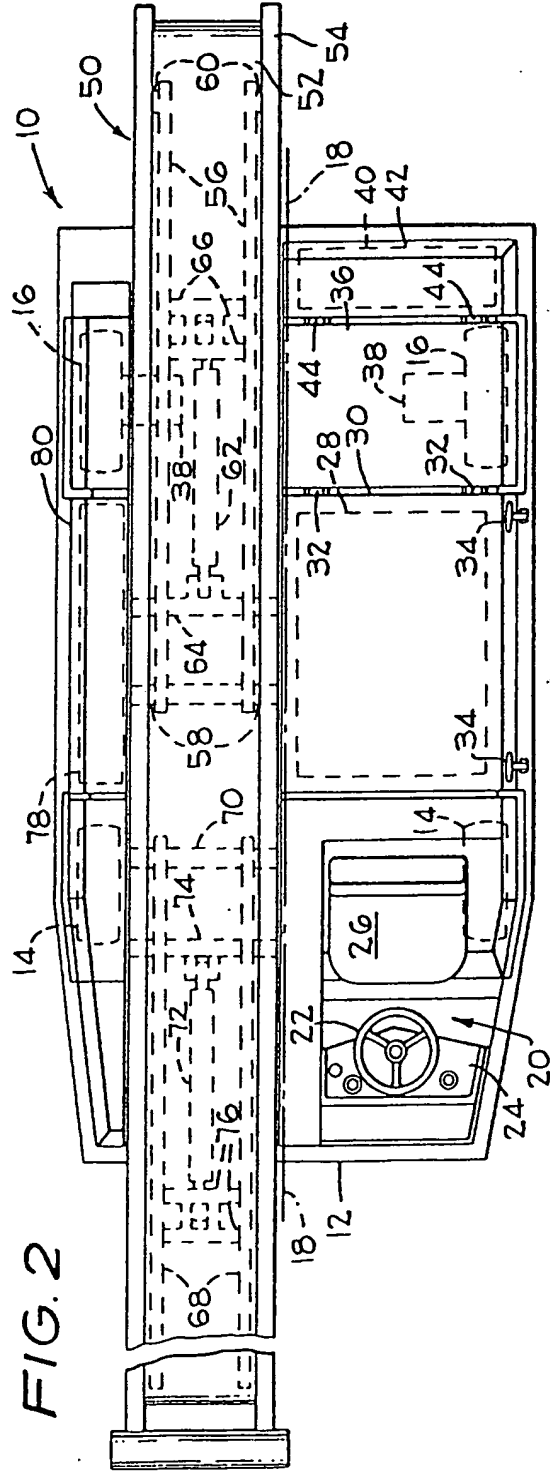


FIG. 2



SPECIFICATION

Low profile aircraft belt loader

- 5 This invention relates generally to low profile belt loaders and, more particularly, to such loaders which are battery powered.

The present invention provides a battery powered aircraft belt loader which has a low profile, a particularly desirable attribute since machines of this type are operated in close proximity to the aircraft they service, which is relatively compact and which is arranged so that service and routine maintenance may be easily and quickly achieved. The arrangement of certain components provide a work platform usable by personnel tending the loader.

Other attributes and desirable features of the present invention will become readily apparent from the perusal of the following description and accompanying drawing wherein:

Figure 1 is a side elevational view of an aircraft belt loader according to the present invention; and

25 Figure 2 is a top plan view of the aircraft belt loader shown in Fig. 1, but to a larger scale.

Referring to the drawing, an aircraft belt loader indicated generally at 10, includes a frame 12 which is supported by a pair of steerable wheels 14 near its forward end and a pair of drive wheels 16 near its rearward end. The frame 12 has a longitudinal or fore and aft center line, in plan view, as shown at 18 in Fig. 2. An operator station, indicated generally at 20, is positioned to one side of the center line and forward of the steerable wheel on that side and includes a steering wheel 22, instrument and control panel 24, and a seat 26. A battery pack 28, which is the power source for the loader 10, is supported by the frame 12 and is positioned on the same side of the center line 18 as, and just behind, the operator station 20. The pack 28 substantially fills the space between the drive and steerable wheels from the center line 18 to the outboard edge of the loader. A battery cover 30 is hinged at 32 to pivot about an axis transverse to the center line 18. Releasable latches 34 hold the cover 30 in its closed position, as indicated in Fig. 1. When latches 34 are released, the cover 30 may be pivoted about hinges 32, as indicated by arrow 35 in Fig. 1, to lay against the adjacent wheel panel 36, which wheel panel covers the drive wheel 16 and its associated drive motor 38. The electrical controls for switching and voltage control between the battery pack 28 and drive motors 38 are contained within a control compartment 40 which is provided with a cover 42 hinged at 44 to pivot, as indicated by the arrow 45 in Fig. 1, about an axis transverse to the center line 18. The upper surfaces of the battery cover 30, the wheel panel 36 and the control cover 42 lie

in substantially the same horizontal plane and thereby provide a level platform for use by personnel working on or around the loader 10.

70 A belt conveyor indicated generally at 50 includes a driven belt 52 mounted on a conveyor frame 54. A rear lift link 56 is pivoted to the loader frame 12 by pivot tube 58 and is pivoted to the conveyor frame by pin 60. A rear lift cylinder 62 has its head end pivotally attached to a cross member 64 and its rod end pinned to the cross members 66 affixed between the arms of link 56. Extension of the cylinder 62 will cause the rearward end of the conveyor 50 to be elevated, and retraction will lower it. A front lift link 68 is also pivotally attached to the loader frame 12 through pivot tube 70 and to the forward end of conveyor frame 54 by means of rollers trapped in oppositely facing channels (not shown) carried by the conveyor frame. A front lift cylinder 72 has its head end pivotally attached to the frame 12 through cross tube 74 and its rod end pivotally attached to the cross members 76 secured between the arms of link 68. Similar to the rearward end, extension and retraction of cylinder 72 will result in raising and lowering the forward end of belt conveyor 50. Because the drive wheels 16 are powered by individual electric motors 38, there is no rear axle transversing the frame 12 and the hydraulic cylinder 62 may be placed as low as possible, consistent with strength and movement arm relationships necessary to achieve pivoting of rear link 56 about tube 58. The hydraulic system, i.e., the hydraulic pump, reservoir, relief valve, tubing, as well as the electric motor for driving the pump, is placed in the hydraulic compartment 78 which is positioned between the wheels 14 and 16 and outward of the conveyor 50 substantially filling the space. A cover 80 encloses the compartment 78 and may also be used as a step or walkway by personnel.

As will be appreciated from the foregoing description, the present invention provides a relatively compact arrangement for the components of an electric drive aircraft belt loader which permits service and inspection of the battery and electrical controls without interference from the belt conveyor. The covers for these components in conjunction with the panel for the drive wheel on that side provide a wide platform for personnel to use in tending the belt and its contents. By positioning the battery on one side of the machine's, fore and aft center line, a channel or depression is formed to accept the conveyor lift linkage when it is fully lowered. This achieves a low profile for the loader. In short, the arrangement of the major components provides an aircraft belt loader with those attributes necessary or desirable on such a machine.

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CLAIMS

1. An aircraft belt loader comprising:
 - a frame having a longitudinal center;
 - a pair of steerable ground-engaging wheels
- 5 supporting the front end of said frame;
 - a pair of ground-engaging drive wheels supporting the rear end of said frame;
 - a pair of electric motors connected to drive said wheels;
- 10 a battery pack connected to power said motors and supported on said frame to one side of said center line between said drive and steerable wheels; and
 - a belt conveyor mounted on said frame on
- 15 the other side of said center line.
2. The invention according to claim 1, and further comprising:
 - A hydraulic reservoir, pump and drive motor positioned on said other side of said center
- 20 line and between said drive and steerable wheels outboard of said conveyor.
3. The invention according to claim 2, and further comprising:
 - an electrical component compartment located on one side of said center line and rearward of said drive wheel.
- 25 4. The invention according to claim 3, and further comprising:
 - a battery cover covering said battery pack
- 30 and hinged about an axis rearward thereof and transverse to said center line.
5. The invention according to claim 4, and further comprising:
 - an electrical compartment cover covering
- 35 said electric compartment and hinged about one axis forward thereof and transverse to said center line.
6. The invention according to claim 5, and further comprising:
 - a motor panel covering said drive motor on
- 40 said one side and forming a level surface with said battery and electric component covers.
7. The invention according to claim 6, and further comprising:
 - front and rear lift links pivotally attached to
- 45 said frame and connected to said belt conveyor;
- front and rear lift cylinders each pivotally attached to between said plate and the associated link; and
- 50 said hydraulic component and said battery pack compartment defining a depression to accept said cylinders and said links.
8. The invention according to claim 7, and further comprising:
 - an operator station on said frame positioned
- 55 on said one side of said center line and forward of said steerable wheel.
9. An aircraft belt loader as claimed in
- 60 Claim 1 and substantially as described with reference to or as shown by the Drawings.